IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	Group Art Unit: 1634
	)	
Focaracci et al.	)	Examiner: Sisson, Bradley L.
	)	
Serial No.: 10/762,991	)	
	)	
Filed: January 21, 2004	)	
	)	
For: Laser Device and Method for Collapsing Hybridization Substrate	)	
	)	
Confirmation No.: 5993	)	
	)	
	)	

Declaration of Julio P. Focaracci Under 37 CFR 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Julio P. Focaracci, declare and affirm as follows:

1. I am a Staff Engineer in the Product Engineering Group at Applied Biosystems Group of Applera Corporation in Foster City, California.

2. I received a Bachelor of Science Degree in Engineering Technology / Mechanical Engineering from California Polytech State University, San Luis Obispo in 1979, and Masters Degree in Business Administration from St. Mary's College in 1988. I am a Registered Professional Mechanical Engineer and a Certified Professional Packaging Engineer. I have been working for Applied Biosystems for eight years of on various projects, mainly in manufacturing research and development. I have over 27 years of experience in manufacturing engineering, mechanical design, and packaging automation.

3. I am an inventor on this patent application (10/762,991).

4. I am familiar with the field of laser processing, including laser cutting and drilling on plastics and elastomers, laser etching on metal, laser ablation of coatings on glass, and I have become familiar with the field of laser processing of substrates used for microarrays during my work at Applied Biosystems.

5. I have reviewed the above-identified patent application, the pending claims, the Office action dated October 13, 2006. From reading the Office action, I understand that the claims were rejected by the Examiner for allegedly failing to meet the requirements of enablement, written description, and definiteness. For the following reasons, I disagree with the rejection.

6. The Examiner has made certain statements about the quantity of experimentation necessary, the amount of direction or guidance presented, and the presence or absence of working examples. Based on my experience in the field of laser processing, including that related to substrates used for microarrays, the present application contains information sufficient to enable one of ordinary skill in the art to practice the present invention without undue experimentation based on the guidance and examples provided in the application and the microarray substrates with porous layers known in the art.

7. The Examiner has stated that the quantity of experimentation is on the order of several man-years, that limited guidance has been provided, and that there are no examples. This is not correct. The present application provides several examples of laser-marking products available on the market at the time of invention: Legend 32EX from Epilog Laser, Inc. (Golden, CO), Vectormark from Borries Marking Systems GmbH (Pliezhausen, Germany), GraphiXscan Laser 500 from Viable Systems, Inc. (Medfield, MA), and Lasonall Marker from Ostling Technologies, Inc. (Chillicothe, OH). Each laser-marking product is accompanied by guidelines from the manufacturer for processing various materials. The guidelines, as taught by the present application in paragraph [0039], are the laser power, laser head speed, and focus. These "can determine the depth of collapse and can be regulated on the particular laser assembly because power is a function of the percentage of maximum power of the laser and laser head speed." One of ordinary skill in the art can use the guidelines from laser-marking products available on the market to achieve a desired result by selecting the focus to modify the width of collapse, the laser head speed to modify collapse time, and the laser power to modify energy absorption. The manufacturer of the laser-marking product provides each of these settings for different materials and applications. The manufacturers offer a variety of types of laser. In the present application, examples of Nd:YAG or CO_2 lasers were given. The present application also gave examples of laser power as values between 5 watts to 500 watts. Taking what is taught in the present application, one of ordinary skill in the art can set up a method and apparatus to collapse a porous layer of material on a substrate for hybridization, for example, NYLON on glass, to form a moat in the porous material.

8. The Examiner has made some specific points relating to the present invention that are also not correct. First, claim 2 comprises collapsing the moat without substantially heating the portion of the porous layer on which the array can be positioned. The present application describes that this

is done by conducting heat away from portion of the porous layer on which the array can be positioned. For example, as taught by the patent application in figure 1B-1C and associated description, by providing a slide holder with a conductive portion and a non-conductive portion such that the non-conductive portion focuses heat at the location of the moat and the conductive portion draws heat away from portion of the porous layer on which the microarray can be positioned. Second, substrates for hybridization with a porous layer coupled to a non-porous material were known in the art at the time of invention. As taught by the present application in paragraph [0026], several patent publications had already described this type of substrate for microarrays. Finally, the claims as amended make clear that the porous layer is coupled to the substrate. However, the present invention can apply to a substrate having any physical dimensions, the guidelines provided by the laser-marking product specify the control settings, and the present application teaches gaskets to inhibit the flow of liquids. Taking what is taught in the present application, one of ordinary skill in the art can set up a method and apparatus to collapse a porous layer of material on a substrate, to form a moat in the porous material, and then use this substrate for constructing a microarray based on what was known in the art.

9. The Examiner has made certain statements about the lack of written description such that the present application does not reasonably convey to one of ordinary skill in the art that the inventors had possession of the invention at the time the application was filed. Based on my experience in the field of laser processing, including that related to substrates used for microarrays, the present application contains sufficient written description to demonstrate to one of ordinary skill in the art that the inventors had captured the features of the present invention based on the figures, definitions, descriptions, and examples provided in the specification.

10. The present application provides several figures and associated description of an exemplary apparatus for preparing the hybridization substrate (Figures 1A-1E), exemplary substrates with moats and gaskets fitted into moats (Figures 2A-2C), and an exemplary system for automating the substrate preparation with microarray spotting (Figure 3). Further, the definitions provide description of collapsing [0024], including examples of how it works, description of the porous layer [0025], including specific examples of material from which to construct the porous layer, description of the substrate [0026], including specific examples of types of non-porous materials and examples of patent publications in the art that have combined porous layers with non-porous substrates for microarrays, description of the array [0028], providing specific examples of densities for microarrays, description of gasket [0029], including specific examples of elastomeric materials for gaskets, and description of laser [0030], including different types of lasers. Finally, several examples of laser-marking products were described at paragraph [0039], including the control parameters and examples of specific lasers and laser power. Taking what is described in the present application, one of ordinary skill in the art would recognize that the inventors had captured the features of the present invention at the time the application was filed.

11. In summary, I believe that the present invention constitutes a true innovation in the field of processing substrates for hybridization that warrants grant of a patent. The application as filed does enable one of ordinary skill in the art to practice the present invention based on guidance provided in the patent application and what was known in the art. In addition, the application

does contain sufficient written description to convey to one of ordinary skill in the art that the inventors had possession of the invention at the time the application was filed.

12. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2/13/07
Date

Julio P. Focaracci